

# **CURRICULUM VITAE SUMMARY**

## **Dr. Douglas C. Engelbart**

**Current Position:** Director, Bootstrap Institute; also  
Part-time Associate, Stanford University Center for Design Research

**Business Address:** Bootstrap Institute, 6505 Kaiser Drive, Fremont, CA, 94555

**Home Address:** 89 Catalpa Drive, Atherton, CA, 94027

**Date & Place of Birth:** January 30, 1925, Portland, Oregon

### **Education**

Year	Degree	Institution	Honors
1948	BS Electrical Engineering	Oregon State University	Senior Honor Student Phi Kappa Phi Tau Beta Pi Sigma Tau Eta Kappa Nu Blue Key
1952	Engineers Degree	UC Berkeley	
1955	PhD Electrical Engineering (with specialty in computers)	UC Berkeley	Sigma XI
1994	Honorary Doctorate	Oregon State University	

### **Employment**

- 1944-46 US Navy, electronic/radar technician, WW II
- 1948-51 Electrical Engineer, NACA Ames Laboratory, Mountain View, CA (now NASA)
- 1955-56 Assistant Professor, EE, UC Berkeley
- 1957-59 Researcher, Stanford Research Institute "SRI" (now SRI International) Worked on magnetic computer components; fundamental study of digital-device phenomena and miniaturization scaling potential.
- 1959-77 Director, Augmentation Research Center, SRI. Directed own research lab of up to 47 people pioneering modern interactive working environment. Developed "NLS" (oNLine System) which integrated many firsts, including the "mouse", display editing, windows, cross-file editing, idea/outline processing, hypermedia, and groupware (incl. shared-screen teleconferencing and computer-supported meeting room). Initiated ARPANET Network Information Center (NIC).
- 1977-84 Senior Scientist, Tymshare, Inc., Cupertino, CA Tymshare bought the commercial rights to NLS, renamed it AUGMENT, and set it up as a principal line of business in a newly formed Office Automation Division.
- 1984-89 Senior Scientist, McDonnell Douglas ISC, San Jose, CA (MDC acquired Tymshare in 1984) Worked closely with the Aerospace Components of MDC on issues of integrated information-system architectures and associated evolutionary strategies (an extension of the SRI work).
- 1989-90 Director, Bootstrap Project, Stanford University (18-Month Project) Laid the groundwork for a multi-corporate *Bootstrap Initiative* for cooperative advanced research in Collaborative Knowledge Development, including: (1) requirements for an open hyperdoc system (OHS); (2) exploratory pilots in which to co-evolve associated work methods with successive OHS prototypes; and (3) in-house deployment strategies. Developed a 3-day management seminar to communicate the underlying strategic framework to executives.
- 1990- Director, Bootstrap Institute, Palo Alto, CA Working closely with industry and government stakeholders on the practical application of his work, and continuing the 3-day management seminars at Stanford University Center for Design Research on a part-time basis.

## Accomplishments

**Summary:** Visionary and pioneering work in organizational augmentation, including strategies for continuous improvement, human-tool co-evolution, and interactive hypermedia computing to support the knowledge-intensive work of groups and individuals.

**Historical:** Developed a comprehensive strategic framework for organizational augmentation, out of which the following accomplishments emerged. Developed an integrated hypertext/groupware system called NLS, most of whose now-common features were conceived of, and in full operational use, by the mid 1970s:

- the mouse
- two-dimensional display editing
- hypermedia
- in-file object addressing
- structured document files
- shared-screen teleconferencing
- online hypertext publishing
- document version control
- integrated email
- outline & idea processing
- multiple viewing modes
- multiple windows
- cross-file editing
- formatting directives
- integrated online help
- computer-aided meetings
- multi-tool integration
- protocols for virtual terminals
- protocols for remote procedure calls
- grammar-driven cmd language interpreter
- compileable "Command Metalanguage"
- distributed, client-server architecture
- uniform command syntax
- universal "user interface" front-end module

An early prototype of NLS was demonstrated live at the 1968 Fall Joint Computer Conference (videotape footage is on display at the Smithsonian Museum Exhibit on The Information Age). In the last decade, thousands of knowledge workers in industry and government have benefited from its unique team support capabilities. In recent years there has been a surge of interest and exploration in the new inter-related topics of Computer-Supported Cooperative Work (CSCW), groupware, and hypertext. It is now recognized that Engelbart's emphasis at SRI on supporting collaborative work, and the breadth of associated system development, not only clearly anticipated this major trend, but produced in NLS what is still the most comprehensive system for supporting wide-area collaboration. Engelbart was also an active participant in the early formation of the ARPANET community, and founded the ARPANET's Network Information Center (NIC).

**Ongoing Original Work:** Dr. Engelbart founded the Bootstrap Institute to pursue the R&D of his innovative and comprehensive strategy for *bootstrapping organizations into the 21st century*. This work covers architectures and design requirements for integrated hypermedia-groupware information systems, best practices for effectively harnessing the technology, and special strategies for developing and deploying these capabilities. Through consulting, management seminars, speaking engagements, publications, and special participatory R&D programs, Dr. Engelbart continues to collaborate with industry and government on the practical application of his work:

- stretching paradigms
- boosting Collective IQ
- Open Hyperdocument Systems
- evolving best practices *online*
- tool-method co-evolution
- advanced exploratory pilots
- high-performance teams
- improving the Improvement Cycle
- a comprehensive *bootstrapping strategy*

Engelbart's life work, with his "big-picture" vision of organizational augmentation, and his persistent pioneering breakthroughs, has made a significant impact on the past, present, and future of personal, inter-personal, and organizational computing.

"Engelbart has forever changed the way we do business in America."	(Coors American Ingenuity Award '91)
"Engelbart's contribution to personal computing is almost inestimable."	(PC Magazine, Nov '87)
"I don't know what Silicon Valley will do when we run out of Doug's ideas."	(Computer Currents, Feb '90)
"It would be difficult to exaggerate Doug Engelbart's effect on the computer industry."	(Electric Word, Mar '90)

## Patents (total number 20)

- 7 patents relating to bi-stable gaseous plasma digital devices resulting from work 1954-58.
- 12 patents relating to all-magnetic digital devices resulting from work 1954-58.
- 1 patent for invention of the Mouse 1963-64 ("X-Y Position Indicator for a Display System") — since 1959, the mouse was the only one of Engelbart's historical "firsts" that was then deemed patentable.

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## Honors

- 1987 "Lifetime Achievement Award for Technical Excellence," presented by PC Magazine at COMDEX in Las Vegas, NV, Nov. 1987, stating "*Engelbart's contribution to personal computing is almost inestimable.*"
- 1987 "Distinguished Alumni of the Year Award," presented by Oregon State University, Corvallis, OR, also naming a room in the new Engineering building in his honor.
- 1989 "Citation for Distinguished Service and Outstanding Contributions in His Field," presented by the Sigma Phi Epsilon Fraternity at a National Conference in St. Louis, Missouri (also awarded to Robert Stempel, then president of GM).
- 1990 "Lifetime Achievement Award for Vision, Inspiration, and Contribution," presented by the Electronic Networking Association in San Francisco, CA, May 1990.
- 1990 "ACM Software System Award," presented to Engelbart and two researchers from his historic SRI lab for their pioneering work on the early versions of the NLS system. Presented at the ACM computer conference in San Antonio, TX, March 5, 1991, as "*a fitting recognition of the importance of this seminal work on interactive system design*".
- 1991 "American Ingenuity Award," presented March 14 at the National Association of Manufacturers' Congress of American Industry in Washington DC, with a trophy and medallion inducting him into the American Ingenuity Hall of Fame. This award is sponsored by Coors "*to honor individuals who have forever changed the way we do business in the United States. This annual award recognizes individuals whose accomplishments are due largely to innovation and perseverance... who have had the courage to bring forth new ideas, but may have done so without widespread recognition.*" The panel of judges included a U.S. Senator and senior executives from industry. Recognition for this award was noted in the Congressional Record by Senator John Seymour on March 14 (Vol.137, No. 44, pp. S3453-4).
- 1991 "Distinguished Alumnus Award," presented by the UC Berkeley Computer Science and Engineering Department, "*for Pioneering Contributions to the Conception and Design of Interactive Computer Systems*".
- 1991 "Lifetime Achievement Award," presented by the Dominican College of San Rafael, CA, Oct. 18.
- 1992 "Pioneer of the Electronic Frontier," presented in Washington DC by the Electronic Frontier Foundation on March 19, naming Engelbart as "*one of our era's true visionaries*".
- 1993 "IEEE Computer Pioneer Award," presented by the IEEE Computer Society January 7 "*as an acknowledgement of his seminal contributions in computer science, in particular those in the field of Human Computer Interaction. This award was established to recognize and honor the vision of outstanding individuals whose efforts have resulted in the creation and continued vitality of the electronic computer industry.*"
- 1994 "Price Waterhouse Lifetime Achievement Award," presented at the 1994 Computerworld Smithsonian Awards Dinner in Washington, DC.

## Associations

- Fellow, American Academy of Arts and Sciences since 1994.
- IEEE member since 1947 (AIEE & IRE); Treasurer, Vice Chairman, and then Chairman of San Francisco Chapter of IEEE Professional Group on Electronic Computers (PGEC) 1957-59.
- National Academy of Science panel on the future role of computers in research libraries, 1968-70.
- National Academy of Science committee on Augmentation of Human Intellect, 1989.
- Computer Professionals for Social Responsibility, Advisory Board Member, ongoing.
- The Technology Center of Silicon Valley, Advisory Council Member, ongoing.
- Has also participated as keynote speaker at many conferences in the U.S. and abroad.

## Publications (total number 33; only principal items cited below)

1. "Special Considerations of the Individual as a User, Generator, and Retriever of Information," in *American Documentation*, 12, No. 2, Apr. 1961.
2. "Augmenting Human Intellect: A Conceptual Framework," in *Summary Report, SRI, on Contract AF 49(638)-1024*, Oct. 1962, 134 pages. Also in *Vistas in Information Handling*, Howerton & Weeks [Ed.], Spartan Books, 1963. Also in *Computer Supported Cooperative Work: A Book of Readings*, Irene Greif [Ed.], Morgan Kaufmann Publishers, 1988. Also in *Organization and Groupware*, T. Nishigaki [Ed.], NTT Publishing, 1992.
3. "Display-Selection Techniques for Text Manipulation," with W.K. English & M.L. Berman, *IEEE Transactions on Human Factors in Electronics*, Vol. HFE-8, No. 1, Mar. 1967.

4. "A Research Center for Augmenting Human Intellect," with W.K. English, *AFIPS Conference Proceedings*, Vol. 33, FJCC, San Francisco, CA, Dec. 1968. Republished in 1988 with #2 above.
5. "Intellectual Implications of Multi-Access Computer Networks," in *Proceedings of the Interdisciplinary Conference on Multi-Access Computer Networks*, Austin, TX, Apr. 1970.
6. "Coordinated Information Services for a Discipline- or Mission-Oriented Community," in *Proceedings of the 2nd Annual Computer Communications Conference*, San Jose, CA, Jan. 1973. Also in *Computer Communication Networks*, R.L. Grimsdale and F.F. Kuo [Ed.], Noordhoff-Leyden, 1975.
7. "Design Considerations for Knowledge Workshop Terminals," in *AFIPS Conference Proceedings*, Vol. 42, NCC Jun. 1973.
8. "The Augmented Knowledge Workshop," with R.W. Watson & J.C. Norton, *AFIPS Conference Proceedings*, Vol. 42, NCC, Jun. 1973.
9. "NLS Teleconferencing Features: The Journal, and Shared-Screen Telephoning," in *CompCon75 Digest*, Sep. 1975.
10. "Toward Integrated, Evolutionary Office Automation Systems," in *Proceedings of the Joint Engineering Management Conference*, Denver, CO, Oct. 1978.
11. "Evolving the Organization of the Future: A Point of View," in *Emerging Office Systems*, R. Landau, J. Bair, & J. Siegman [Ed.], Ablex Pub., Norwood, NJ, Mar. 1980.
12. "Toward High-Performance Knowledge Workers," in *OAC '82 Digest*, Proceedings of the AFIPS Office Automation Conference, San Francisco, CA, Apr. 1982. Republished in 1988 with #2 above.
13. "Collaboration Support Provisions in AUGMENT," in *OAC '84 Digest*, Proceedings of the 1984 AFIPS Office Automation Conference, Los Angeles, CA, Feb. 84.
14. "Authorship Provisions in AUGMENT," in *COMPCON '84 Digest*, Proceedings of the COMPCON Conference, San Francisco, CA, Feb. 1984. Republished in 1988 with #2 above. Also in *Groupware: Software for Computer-Supported Cooperative Work*, D.Marca & G.Bock [Ed.], IEEE, 1992.
15. "The Augmented Knowledge Workshop," in *A History of Personal Workstations*, Adele Goldberg [Ed.], ACM Press, NY, 1988. Also in companion video of 1986 delivery of this paper.
16. "Working Together," with H.G. Lehtman, *BYTE Magazine*, Dec. 1988.
17. "The Augmentation System Framework," with K. Hooper in *Interactive Multimedia*, S. Ambron & K. Hooper [Ed.], Microsoft Press, 1988.
18. "Bootstrap Seminar Binder," from 3-day management seminar *A Comprehensive Strategy for Bootstrapping Organizations into the 21st Century*, Stanford, CA, Mar. 1992. Annotated slides and selected readings, Bootstrap Institute, 1989 (recently revised)..
19. "Knowledge-Domain Interoperability and an Open Hyperdocument System," in *Proceedings of the Conference on Computer-Supported Cooperative Work*, Los Angeles, CA, Oct. 1990. Republished in *Hypertext/Hypermedia Handbook*, E.Berk & J.Devlin [Ed.], McGraw-Hill, NY, 1991.
21. "The Augmentation Papers: A Collection Since 1960," a spiral-bound collection of all the above papers, D. C. Engelbart [Ed.], Bootstrap Institute, 1991 (recently revised).
23. VHS Video "Together We Can Get There," an interview with P.Seybold, Bootstrap Institute, 1991.
20. "Toward High-Performance Organizations: A Strategic Role for Groupware," in *Proceedings of the GroupWare'92 Conference*, San Jose, CA, Morgan Kaufmann Publishers, 1992.

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